

Vegetation at Pinnacles National Park may be broadly grouped into five major habitat types or vegetation associations, described below. These associations result from a web of interactions amongst the various plant species and such factors as soil type, direction of exposure, slope, moisture regime and fire history. Recognizing the plants that characterize an association allows us to see the patterns of these co-occurring factors.

### **Chaparral**

The most widespread plant community, chaparral occurs just about everywhere you look. Found on shallow or deep soils, north- or south-facing slopes, moist canyon bottoms or exposed upper ridges, eighty-two percent of the Park is covered by some type of chaparral. All chaparral associations share similar characteristics, though the species composition and structure differ in relation to environmental factors.

This vegetation type is composed mostly of shrubs up to two meters tall, and is adapted to grow in warm climates with little or no summer moisture, and variously wet winters. To survive and even thrive in the long hot summers, many of the plants have evolved adaptive traits such as small waxy-coated leaves, deep taproots, shrubby stature, water storage structures, and summer dormancy.

In addition, many chaparral plant species have adapted to the natural occurrence of fire. For example, seeds of some chaparral plants lie dormant in the seedbank for years before a fire stimulates them to sprout. Dependent on disturbance and seedcoat scarification for seed germination, the plants may appear suddenly after a fire, even in areas in which they have long been absent.

Chamise, with small needle-like leaves, is the dominant shrub at Pinnacles. Spikes of white flowers bloom at the tips of the branches from May through July. Chamise grows in mixes of other species, including buck brush, manzanita, holly-leaved cherry, mountain-mahogany and black sage. The composition of the chaparral varies depending on soil type and direction of exposure, amongst other factors. The many species of the annual and perennial understory also vary depending on moisture and exposure. As a general rule, dry south-facing stands have fewer species than moister north-facing stands.

### **Woodlands**

Woodlands, the second most common association in the Park, occur from lower riparian areas to upper exposed slopes of North Chalone Peak, and are characterized by trees with annual grasses and forbs in the understory. The main woodland association at Pinnacles is the blue oak woodland, comprising 10 percent of the total vegetation cover in the Park. Gray pine, California buckeye, valley oak and live oak appear both in this and the riparian associations. In the woodland habitat type, however, these tree species are only minor components, while in riparian areas they play a more significant role. The woodland understory is a mixture of non-native grasses, perennial native grasses and a variety of annual and perennial forbs.

### **Riparian**

This habitat type is restricted to the valley bottoms and sheltered, moist canyons of the Park. The

species are deep-rooted and require more water than any of the other vegetation associations. Large deciduous and evergreen species dominate, such as sycamore, cottonwood, and California buckeye, often growing directly in small creeks and streams. Other major species include valley oak, live oak, and gray pine, as well as willow and mule fat. The understory in this community consists of shade-loving perennials with few annual species.

### **Grasslands**

Found in most of the same areas as the rock and scree association described below, and closely related, grasslands have shallow soils that prevent the establishment of deep-rooted species. Dominant species include introduced grasses such as brome; native and non-native annuals including fiddleneck and filaree; and a variety of mostly native herbaceous perennials like lomatiums.

### **Rock and Scree**

Though the rock and scree habitat type is the least common in the Park, its dramatic spires and rock faces inspired the establishment of Pinnacles National Park. Named for its predominant substrate, the association is characterized by having little or no soil. This slight but important difference in soil depth largely accounts for contrasts between the vegetation of this and the grasslands habitat. Despite demanding conditions, some plants have developed the ability to flourish here. Bitter root and two-leaved onion, for example, are among the most spectacular plants in the Park, and are found in rocky areas of the High Peaks, Balconies and South Chalone Peak.